

The listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (currently amended) A method of reducing artifacts in steady state free precession (SSFP) signals for use in magnetic resonance imaging comprising the steps of:
 - a) applying a plurality of SSFP imaging sequences to an object to be imaged,
 - b) acquiring image data for each of the SSFP imaging sequences,
 - c) weighting the image data to emphasize higher **magnitude** signals,
 - d) combining the weighted image data **from all imaging sequences**, and
 - e) establishing an image signal based on the combined weighted image data.
2. (original) The method as defined by claim 1 wherein the plurality of SSFP imaging sequences are phase-cycled.
3. (currently amended) ~~The method as defined by claim 2 wherein step e) squares the image data for each sequence, and step d) sums the squares of the image data~~ **A method of reducing artifacts in steady state free precession (SSFP) signals for use in magnetic resonance imaging comprising the steps of:**
 - a) **applying a plurality phase-cycled of SSFP imaging sequences to an object to be imaged,**
 - b) **acquiring image data for each of the SSFP imaging sequences,**
 - c) **weighting by squaring the image data for each sequence to emphasize higher signals,**
 - d) **combining by summing the weighted image data, and**
 - e) **establishing an image signal based on the combined weighted image data.**
4. (original) The method as defined by claim 3 wherein step e) establishes an image signal from the square root of the sum of the squares of the image data.

5. (currently amended) ~~The method as defined by claim 2 wherein step e)~~
~~weights the image data~~ A method of reducing artifacts in steady state free precession (SSFP) signals for use in magnetic resonance imaging comprising the steps of:

- a) applying a plurality of phase-cycled of SSFP imaging sequences to an object to be imaged,
- b) acquiring image data for each of the SSFP imaging sequences,
- c) weighting the image data to emphasize higher signals based on a computed off-resonance profile using a magnetic field map for the imaged object,
- d) combining the weighted image data, and
- e) establishing an image signal based on the combined weighted image data.

6. (currently amended) ~~The method as defined by claim 2~~ A method of reducing artifacts in steady state free precession (SSFP) signals for use in magnetic resonance imaging comprising the steps of:

- a) applying a plurality phase-cycled of SSFP imaging sequences to an object to be imaged,
- b) acquiring image data for each of the SSFP imaging sequences wherein N phase-cycled individual SSFP image acquisitions are performed with the nth acquisition incrementing the phase from excitation to excitation by

$$\Delta\phi = 2\pi n/N_2$$

- c) weighting the image data to emphasize higher signals,
- d) combining the weighted image data, and
- e) establishing an image signal based on the combined weighted image data.

7. (original) The method as defined by claim 6 wherein step c) squares the image data for each sequence, and step d) sums the squares of the image data.

8. (original) The method as defined claim 7 wherein step e) establishes an image signal from the square root of the sum of the squares of the image data.

9. (original) The method as defined by claim 8 wherein the SSFP image data is two-dimensional.

10. (original) The method as defined by claim 8 wherein the SSFP image data is three-dimensional.

11. (currently amended) The method as defined by claim ~~[[1]]~~ **13** wherein the SSFP image data is two-dimensional.

12. (currently amended) The method as defined by claim ~~[[1]]~~ **13** wherein the SSFP image data is three-dimensional.

13. ~~The method as defined by claim 1~~ **A method of reducing artifacts in steady state free precession (SSFP) signals for use in magnetic resonance imaging comprising the steps of:**

a) applying a plurality of SSFP imaging sequences to an object to be imaged,

wherein each SSFP imaging sequence includes:

- i) placing a body in a magnetic field,
- ii) applying gradient magnetic fields to the body,
- iii) applying a plurality of RF excitation pulses to the body at repetition time, TR, to flip nuclei spins, with RF phase incremental from TR to TR by a phase increment, $\Delta\phi$
- iv) rewinding all gradients over each repetition time, TR,
- v) measuring refocused MRI signals at echo times, TE during each sequence, and
- vi) repeating steps ii-v) for subsequent sequences with the RF excitation pulses in each sequence being incremented in phase by a different $\Delta\phi$.

b) acquiring image data for each of the SSFP imaging sequences,

c) weighting the image data to emphasize higher signals,

- d) combining the weighted image data, and**
- e) establishing an image signal based on the combined weighted image data.**